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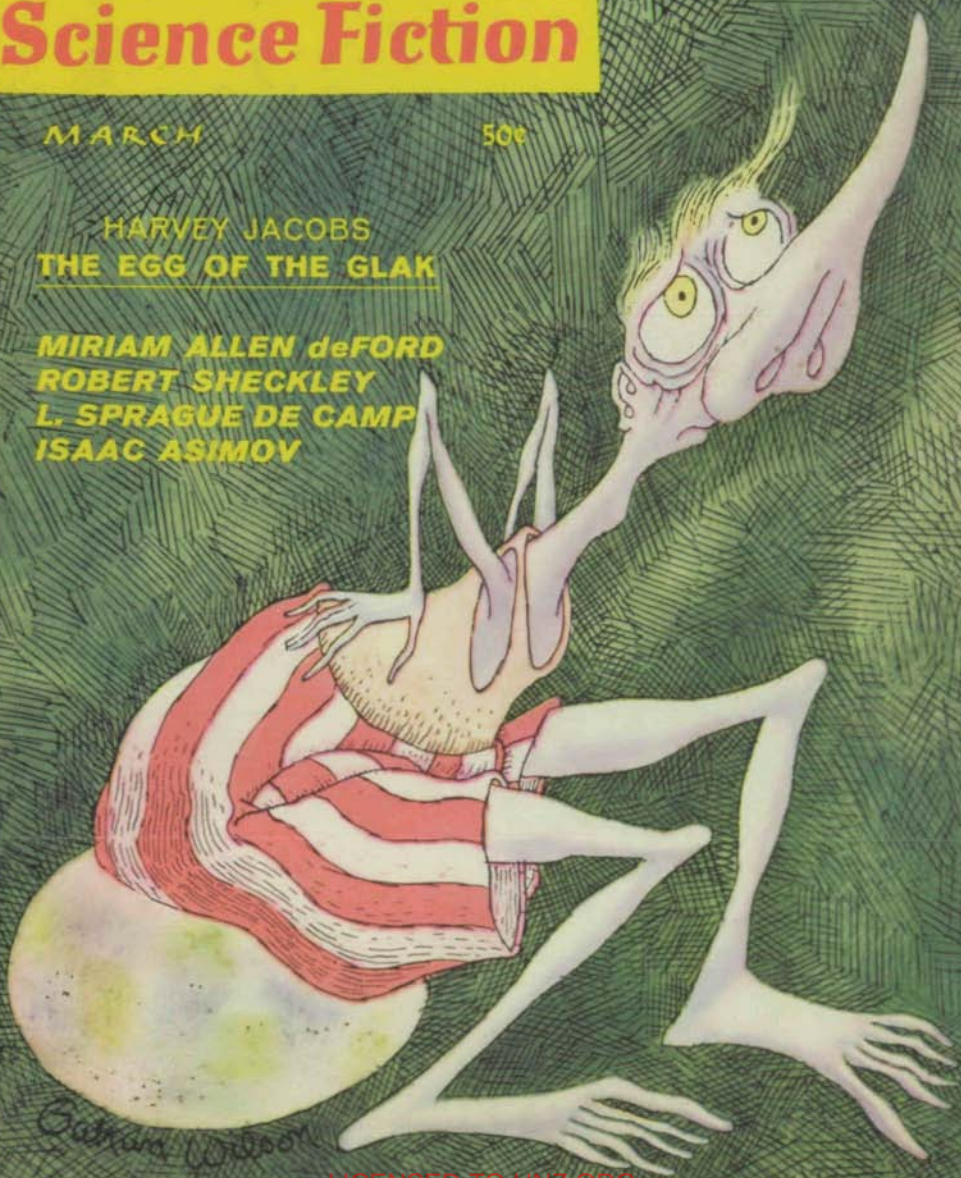
Science Fiction

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HARVEY JACOBS
THE EGG OF THE GLAK

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DINOSAURS IN TODAY'S WORLD

ARTICLE

by L. Sprague de Camp

WHEN OUR FOREFATHERS TRIED to think up the most terrible beast they could, they imagined the dragon. One of the simpler dragons, for example, was Python, whom the god Apollo slew at Delphi. Python was just an enormous snake, and we call a family of real snakes after him today. To other dragons, imagination added lizard's legs, or bat's wings, or a sting at the end of the tail, or a fiery breath, or the power of thought and speech, or some combination of these.

Ancient legend creeps and crawls with these super-saurians: Apepi in Egypt, Tiamat in Babylonia, and the Ashi Dahaka in Iran. Heroes like Bellerophon and Beowulf, Sigurd and St. George slay a dragon as their crowning deed of dought. Warriors from Agamemnon down painted dragons on their shields; kings like Richard the Lion-Hearted embroidered them on their standards. The learned Konrad von Gesner in the sixteenth century and the equally learned Father Athanasius Kircher in the seventeenth devoted whole chapters of their books to dragon lore.

For evidence, men produced fossil bones, which they attributed not only to dragons but also to giants. The "giants" were usually remains of the extinct kin of the elephant: mammoths and mastodons. If one looks at the skull of an elephant, one sees that it does look a bit like the skull of a monstrously hideous man, five or six times natural size. The "dragons" were often based upon the skulls of the extinct woolly rhinoceros or the great cave bear. Some pictures and statues of medieval dragons, with long, slender necks and small, serpentine heads, look as if they might be based upon the well-preserved skeleton of a plesiosaur, but there is no actual evidence of such a finding.

The skeptical eighteenth century taught educated men that there were no dragons. European explorers had traveled far and wide through the Americas, Asia, and Africa. Although they heard rumors of dragon-like beasts, nobody ever caught one. To be sure, Asia, Africa, and the American tropics harbored serpents and crocodilians of formidable size. These, however, were now well-

known animals, without a trace of fiery breath or bat-like wings.

So, with a little sigh, people gave up their dragons. The dragon took refuge in fairy tales. Here he comes to such ludicrous ends as that of the Purple Dragon in L. Frank Baum's *The Magical Monarch of Mo*, who is stretched out thin and cut up into fiddle strings.

Or rather, people *thought* they had given up their dragons. No sooner had the legend been banished than the dragons popped into view again. In 1790, the skull of a huge, unknown reptile was found in a quarry near Maas-tricht in the Netherlands. In 1794, the skull was identified by Georges Cuvier, the pioneer Franco-German-Swiss paleontologist, as that of a giant marine lizard, which was named a mosasaur. Cuvier also identified a small, winged fossil in the collection of the Elector of Bavaria as that of a flying reptile, which he named a pterodactyl.

Then, in 1811, Mary Anning, a twelve-year old girl who ran a curio shop on the southern coast of England, discovered the remains of another marine reptile, an ichthyosaur, in the cliffs near her home town. Ten years later she found another, which became known as a plesiosaur. The next year a British physician, Gideon Mantell, found the first known dinosaur, an iguanodon, in Tilgate Forest. Throughout the century,

remains of more and more amazing fossil reptiles kept coming to light. Evidently, dragons had lived once upon a time.

Naturally, all this talk about real dragons brought up the question: Did any such creatures still exist? A hundred years ago, this question was not so foolish as it sounds today. At that time, the map of the world still showed many large blanks.

Since one would expect to find dinosaurs in a hot, damp climate like that of most of the world in Mesozoic times, Central Africa seemed a hopeful place to look for such survivals from the past. In fact, several sizeable animals were first brought to light there by white men after the turn of the century. There was the okapi, which Sir Harry Johnston discovered in the Congo in 1900; the giant forest hog, collected by Lieutenant Minertzhagen in 1904; and the pygmy hippopotamus, which Hans Schomburgk found in Liberia in 1912.

Schomburgk collected live animals for Carl Hagenbeck, the wild-animal dealer of Hamburg. In Liberia, Schomburgk was told of a beast in Lake Bangweolo, which killed hippopotami. Hearing the tale, Hagenbeck sent an expedition to Lake Bangweolo, but this group could not even find the lake.

Nor was this all. In 1913, a German expedition under Captain von Stein, to the then German col-

ony of Kamerun, heard tales of a similar hippopotamus-killer called the *mokéle-mbémbé*. The First World War ended this expedition before the searchers could run down the rumors. According to the tale, the *mokéle-mbémbé* had a smooth skin, a long neck, and a single large tooth or horn. There have been other accounts as well, including one alleged sighting of a pair of iguanodonts.

Despite these fascinating tales, no dinosaurs or other Mesozoic reptiles materialized. The rapid opening up of Africa by road and rail has gone on apace during the last half-century, together with the dwindling of the wild life, until today most of Africa is not much wilder than Ohio. It is scarcely credible that any beast large enough to kill hippopotami could have survived undiscovered. The same must be said of the jungles of tropical South America and southeast Asia.

The African dinosaur tales, then, are but the last stage of a process that has gone on ever since Europeans began to learn about the other continents. First came the stage of wild rumors. At this time, explorers and natives did not understand each other beyond a few words, and the explorers did not believe in spoiling a good story for the sake of a few facts. Hence the wildest yarns were brought back to Europe, to arouse the awe of stay-at-homes. Some-

times the stories were made up out of whole cloth; sometimes they were an exaggeration or a misunderstanding of something real; and sometimes they turned out to be true.

Thus the classical Greeks heard that in India dwelt the *martichora*, with "a face like a man's; a skin red as cinnabar, and . . . as large as a lion. It has three rows of teeth, ears and light-blue eyes like those of a man; its tail is like that of a land scorpion." From this tail it shot stings, whose wound was fatal. Indians hunted it on elephants. Here we can recognize a fantastic account of the Indian tiger.

Besides the monster tales that have resulted from misunderstanding, credulity, exaggeration, and plain lying, many such yarns have arisen from the natives' honest beliefs in mystical monsters. Most primitive peoples harbor such beliefs; so, before the modern age of science, did everybody. Sometimes the monster was merely a small beast writ large. The Maoris, for instance, told of a dreadful dragon, the *taniwha*. This was only the harmless, two-foot tuatara, a lizard-like reptile of ancient lineage from New Zealand, envisioned the size of a whale. Or, like the Babylonian *sirrush*, the animal might be a composite of several known beasts.

Many early dragon legends are plainly based upon reports of py-

thons and crocodiles by people who had heard about them at second hand. The salt-water crocodile of southeast Asia, *Crocodylus porosus*, may exceed 40 feet in length. This is as formidable a monster as any reasonable man could want. What, however, are the possibilities of the survival into historic times of any large land reptile, other than a crocodile or a giant snake?

Of dinosaurs the chance is negligible. If dinosaurs had survived as late as the Pleistocene, the paleontologists would surely have come upon their remains among the vast masses of Cenozoic fossils they have gathered during the last century.

The true lizards, however, have reached imposing size. The largest living lizards are the monitors of the genus *Varanus*. Of these, about thirty species are scattered about the tropical parts of the Old World. They are of rather slender form, most species reaching a length of three to six feet, with forked tongues.

The champion monitor is the Komodo dragon, *Varanus komodensis*, discovered by Europeans in 1912. This mighty lizard, which dwells on three small Indonesian islands and has been doubtfully reported from New Guinea, reaches a length of ten feet and may weigh as much as a large man. Among other prey, it kills wild pigs for its dinner.

Men who have caught the Komodo dragon for zoos have found it a formidable captive. The lizard is as powerful as an alligator of similar size and even more active. When snared, it leaps furiously about, hissing like a steam engine and trying to bite and claw its captors. Moreover, it has the disagreeable habit of vomiting all over them.

Early travelers' tales of the Komodo monitor may have gone into the general stock of tales whence the dragon legends were fabricated. It would not take much exaggeration to make the Komodo monitor into a story-book dragon. In the case of the related fossil genus *Megalania*, from the Australian Pleistocene, no exaggeration would be needed; this lizard reached a length of 20 to 30 feet.

One is tempted to ask if the last survivors of *Megalania* may not have been seen by men and embroidered into dragon legends. . . . But alas, the fossils of *Megalania* all go back long before historic times, and Europeans did not certainly sight Australia until Luis Vaez de Torres glimpsed Cape York in 1606. So no connection between *Megalania* and any mythical dragon is likely.

There remains the question of the sea serpent. Whereas the hope of finding live dinosaurs has faded with the opening up of the world's last unexplored lands, interest in

sea serpents has remained lively. Sea-serpent enthusiasts come close to forming a cult, like those of believers in the Lost Ten Tribes of Israel, the occult wisdom of the Great Pyramid, or Plato's Atlantis.

Harvard's Museum of Comparative Zoology displays the 42-foot skeleton of a giant short-necked plesiosaur, *Kronosaurus*, from the Australian Cretaceous. First collected in 1931, work on this skeleton was completed in the 1950's with money furnished by a Bostonian named Godfrey L. Cabot (1861-1962). Cabot, who lived to be over 100, was a sea-serpent enthusiast—or, as the Museum more tactfully puts it, "a man with a lifelong interest in marine reptiles." Now, perhaps in memory of the durable Mr. Cabot and his hobby, a sign reading TO THE SEA SERPENT points the way to the kronosaur.

There is enough apparently sober testimony about the sea serpent to imply that some unknown monster might, after all, lurk in the vastness of the ocean. Since the sea serpent is sometimes supposed to be a plesiosaur, it qualifies as a Mesozoic reptile if not as a dinosaur.

The sea-serpent legend began with an imaginative sixteenth-century Swedish archbishop, Olaus Magnus, who spent his last decades in retirement in a monastery in Rome. Here he wrote a *History of the Northern Nations*

(1555). In this book, Olaus devoted a section to the sea monsters said to haunt the coasts of Norway. He told of ship-eating whales. He told of the kraken or giant squid, whose long-doubted existence was finally admitted in the 1870's. And he told of the sea serpent; a copper engraving in his book showed such a serpent attacking a ship.

Once the sea-serpent tales of Olaus and his successors were in print, stories of encounters with marine monsters became more and more frequent. The monsters, also, became more serpentine. One of the most celebrated sea-serpent stories was the report of a British naval captain in 1848:

Her Majesty's Ship *Daedalus*
Homoeaze, Oct. 11

Sir,—In reply to your letter of this day's date, requiring information as to the truth of a statement published in *The Times* newspaper, of a sea-serpent of extraordinary dimensions having been seen from Her Majesty's ship *Daedalus* . . . I have the honour to acquaint you, for the information of my Lords Commissioners of the Admiralty, that at 5 o'clock p.m. on the 6th of August last, in latitude 24° 44' S., and longitude 9° 22' E. [in the South Atlantic], the weather dark and cloudy, wind fresh from the N.W., with a long ocean swell

from the S.W., the ship on the port tack heading N.E. by N., something very unusual was seen by Mr. Sartoris, midshipman, rapidly approaching the ship from before the beam. The circumstance was immediately reported by him to the officer of the watch, Lieut. Edgar Drummond, with whom and Mr. William Barrett, the Master, I was at the time walking the quarter-deck . . .

Our attention being called to the object it was discovered to be an enormous serpent, with head and shoulders kept about four feet constantly above the surface of the sea, and as nearly as we could approximate by comparing it with the length of what our main-topsail yard should show in the water, there was at the very least 60 feet of the animal *à fleur d'eau*, no portion of which was, to our perception, used in propelling it through the water, either by vertical or horizontal undulation. It passed rapidly, but so close under our lee quarter, that had it been a man of my acquaintance I should have easily recognized his features with the naked eye; and it did not, either in approaching the ship or after it had passed our wake, deviate in the slightest degree from its course to the S.W., which it held on at the pace of from 12 to 15 miles per hour, apparently

on some determined purpose.

The diameter of the serpent was about 15 or 16 inches behind the head, which was, without any doubt, that of a snake, and it was never, during the 20 minutes that it continued in sight of our glasses, once below the surface of the water; its colour a dark brown, with yellowish white about the throat. It had no fins, but something like the mane of a horse, or rather a bunch of seaweed, washed about its back. It was seen by the quartermaster, the boatswain's mate, and the man at the wheel, in addition to myself and officers above mentioned . . .

I have, etc.

Peter M'Quhae, Captain
To Admiral Sir W. H. Gage,
G. C. H., Davenport

After Mesozoic reptiles became well known, reports of sea serpents, which until then had tended towards the serpentine, began to describe the monster as more and more resembling a Mesozoic marine reptile like a plesiosaur or a mosasaur. These reports have continued to the present. A flock of stories took wing in the 1930's about a monster in Loch Ness, Scotland.

Some tales are certainly hoaxes or hallucinations. One must read some of the literature of hoaxes to realize how often apparently so-

ber, upright, solid citizens perpetrate them. Sometimes they do it for money, sometimes for momentary fame, sometimes to persuade people of some pet theory, and sometimes just for the fun of fooling the marks.

Other cases, such as that of the *Daedalus*, are not so easily explicable. With so many people in on the hoax, it is probable that one or another would betray the secret. Hence many cases remain where the witness probably saw something, although not necessarily a sea serpent in the usual sense.

Several marine animals can be mistaken for sea serpents. These include the finback whale and its smaller cousin, the sei whale. Both are long, slender whales of almost serpentine form. Others are the kraken, the basking shark, the whale shark, and the ribbonfish, which rarely comes to the surface and which reaches a length of 30 feet. Groups of smaller animals swimming in a single column, such as sea lions or porpoises, can give the impression of a sea serpent by simultaneously breaking the surface.

That still leaves cases like that of the *Daedalus* unaccounted for. We must bear a couple of cautions in mind. For one, we ought to keep an open mind on such doubtful questions until they are cleared up. By "cleared up" I mean until somebody catches an actual specimen or until the oceans have been so

completely explored that no unknown monster could still dwell in them.

The other caution is that, in want of a specimen, mere testimony is never enough to establish the improbable, no matter how detailed the accounts or how respected the witnesses. The reason is that, if the testimony of sane and sober witnesses were enough to establish a fact, then we should have to believe not only in sea serpents but also in witches on broomsticks, ghosts, devils, angels, elves, gnomes, mermaids, dragons, gryphons, unicorns, bleeding statues, magical spells, miraculous cures, prophetic powers, talking beasts, gods appearing on earth, flying saucers, and scores of other wonders for which volumes of convincing testimony can be mustered.

Suppose that some sea-serpent witnesses have seen something that is neither whale, shark, squid, floating log, school of porpoises, nor any of the other things often used to explain sea-serpent sightings. Let us assume that a large, undescribed animal, which has caused these reports, is loose in the sea. What could it be?

Two obvious answers are a plesiosaur or a mosasaur. Then such a beast must have survived all those seventy million years since the end of the Mesozoic Era. It should, then, have left its bones in some Cenozoic marine fossil-bearing bed. Neither beast has.

The Age of Mammals, or Cenozoic Era, furnished a creature that would make an equally good sea serpent. This is the primitive whale *Basilosaurus*. The fore part of this whale looked like that of one of the smaller-toothed whales of today. The after part, however, was drawn out into a long, serpentine tail with a pair of flukes on the end, so that the animal reached a length of 60 feet. Since *Basilosaurus* swam by rippling that snaky tail up and down, it would, on the surface, look much like the conventional picture of a sea serpent.

But *Basilosaurus* encounters the same difficulty as the Mesozoic reptiles. Remains of these whales all come from the early Cenozoic Era—Eocene and Oligocene deposits—and none from a later period. The inference is, therefore, that the Basilosauridae have been extinct for thirty to forty million years.

Professor A. C. Oudemans, who three quarters of a century ago wrote a book on the sea serpent, suggested that the Great Unknown was a pinniped: a member of the order that includes the seals, walruses, and sea lions, but with a much longer neck and tail. We may picture it as a kind of fur-bearing plesiosaur.

Aside from lack of late fossil remains, the fatal flaw in theories of reptilian or mammalian sea serpents is that all these creatures

would be air breathers. Hence they would have to surface to breathe. In these days, when the oceans are stitched and webbed by ship and airplane routes, and the great whales have been nearly exterminated by Norwegian, Russian, and Japanese whalers, who hunt with helicopters, the chances that any large, surface-dwelling marine animal would be overlooked are negligible. In the modern world, there is just not enough undisturbed space for air-breathing Great Unknowns to hide.

The most plausible candidate for the role of sea serpent is something else. The common eel lives most of its life in the fresh waters of western Europe and eastern North America. When the urge comes upon it, it swims downstream to the ocean and thence to the Sargasso Sea. There the eels lay their eggs and die. From the eggs hatch leaf-shaped, transparent larvae, which set out upon the landward journey at a speed of about a thousand miles a year.

These larvae reach a length of four inches and then turn into conventional eels, losing height from top to bottom, thickening from side to side, and acquiring color. About that time, they reach their ancestral rivers, which they ascend. Then they grow to their full length of 3 to 5 feet.

On 31 January, 1930, the Danish research ship *Dana*, off the Cape of Good Hope, caught an eel

larva. Like others, it was flat, leaf-shaped, and transparent. But, instead of being 3 or 4 inches long, it measured 6 feet, $\frac{1}{2}$ inch in length.

Now, it may be that eels of this species grow to maturity without getting any longer; they simply shrink vertically and thicken laterally until they turn into normal 6-foot eels. On the other hand, if the adult form bears the same ratio to the larva as in fresh-water eels, the adult would be 60 to 100 feet long. To me, this would make a quite satisfactory sea serpent until a better one comes along.

But does this hypothesis explain the case of H.M.S. *Daedalus*? Alas, no. For one thing, eels do not swim with their heads out of water, as the *Daedalus*' serpent was said to do. For another, eels swim by wriggling from side to side, which Captain McQuhae specifically denied in the case of his monster.

I have a theory—a guess, a tentative surmise—about this sighting. It may be right or wrong, and at this late date it cannot be proved one way or the other. But at least it seems to fit the facts more comfortably than some previous surmises.

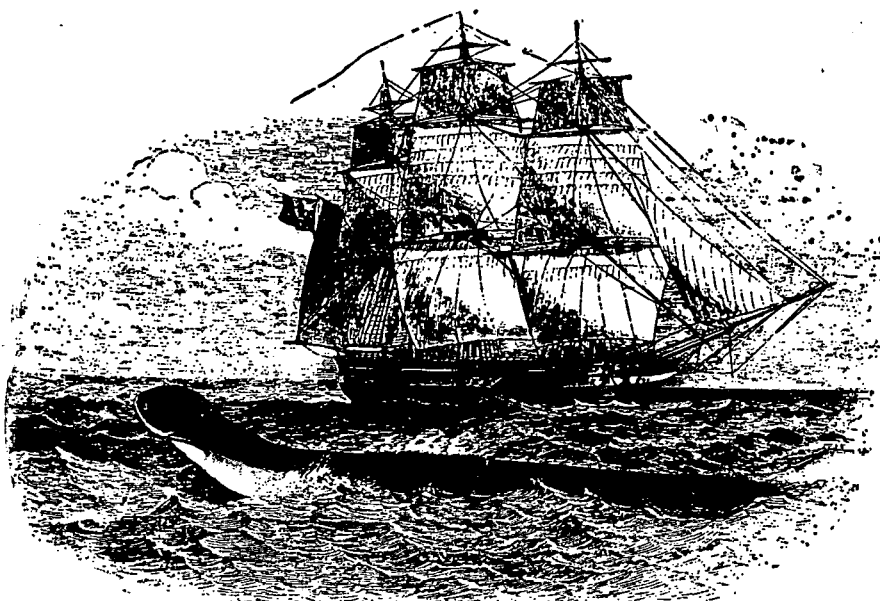
This theory is that a couple of fishermen, out in their dugout canoe off the coast of West Africa or Brazil, rashly harpooned a whale shark, with their harpoon line belayed to the canoe. The

harmless whale shark, the largest living fish, reaches a length of 45 (some say 60) feet and is fairly common in tropical waters. The harpoonee might have been some other large marine animal, but the whale shark seems the likeliest.

This particular shark, not seriously hurt but quite indignant, took off, towing the canoe like a chip behind it. Failing for some reason—possibly simple panic—to cut or untangle the line, the fishermen dove over the side and struck out for shore, leaving the shark to tow the derelict about the South Atlantic for weeks or months, until the harpoon tore out or the line rotted and broke.

If you look squint-eyed at the picture drawn under Captain McQuhae's direction for the *Illustrated London News* for October 28, 1848, you will see that the "serpent" does in fact look like such a canoe. The dark "back" of the monster is the shadowed interior of the vessel. The "head" is the flat place at the overhang of the bow, where the primitive fisherman rests one foot in casting his net or harpoon.

This theory accounts for the curious mode of progress of the serpent, in a straight line without visible wriggling. The "mane" could be either seaweed that had grown on the derelict or water splashing about inside the boat as it labored through the swells, or both. Do I hear any objections?



The *Daedalus* sea serpent, as depicted in a drawing made under the supervision of Capt. McQuhae and published in the *Illustrated London News*.

It looks, then, as if the dinosaurs and other spectacular Mesozoic reptiles were gone for good, rumors to the contrary notwithstanding. But they did not pass without influencing the modern world. For one thing, the recovery of their fossils during the nineteenth century helped the rapid spread and acceptance of the theory of evolution. They did this not so much directly (although in their own evolution they followed the same principles as other life forms) but indirectly, by arousing public interest in prehistoric life and thus drumming up support for museums and paleontological

expeditions. This research piled up mountains of evidence, all favorable to Darwin's theory of evolution by natural selection.

Mesozoic reptiles also enjoyed a resurrection in the form of fiction, becoming standard plot elements in the science-fiction story. As in so many branches of imaginative fiction, Jules Verne took the first step. In *A Journey to the Centre of the Earth* (1864), his explorers of a network of underground caverns witness a fearful fight between an ichthyosaur and a plesiosaur in the waters of an underground sea. (In real life, ichthyosaurs and plesiosaurs were prob-

ably much too busy chasing fish to bother each other.)

Since then, dinosaurs and other antique reptiles have been brought on stage in scores of tales. Sometimes they have survived to the present in out-of-the-way places, as in Conan Doyle's *The Lost World* (1912). Like the lost-race story, tales of this type have become steadily less plausible with the unveiling of earth's last strongholds of mystery. Sometimes the story is laid in the Mesozoic. It may simply narrate the doings of that world's reptilian denizens; or it may bring a crew of people back to the past by time machine.

Most exasperating, to people who know anything about dinosaurs, are the many stories, comic strips, movies, and TV shows wherein our skin-clad ancestors are shown as battling dinosaurs. It is an elementary fact that all the great Mesozoic reptiles became extinct about seventy million years before man evolved from his apish ancestors. So to show early men and dinosaurs together is as glaring an anachronism as Julius Caesar in a derby hat.

Suppose we *could* go back to the Mesozoic to hunt dinosaurs. What would such a safari be like?

Transportation would be a problem. A jeep or even a tracked vehicle—even if it could enter the time machine—might prove more trouble than it was worth, since in

the Mesozoic Era there were no roads and no sources of gasoline. Most of the ground would be very rough, since there was no grass between the trees and shrubs to retard erosion. Grass first appeared around the end of the Cretaceous and became really widespread only in the Cenozoic Era. So one would have to take pack asses or mules. In most places, there would be enough natural forage for these animals.

As for guns, hunters of modern thick-skinned game—elephant, rhinoceros, and hippopotamus—argue over the best kind of gun. Some like a heavy, repeating rifle of the kind used for large, thin-skinned game, like moose, grizzly bear, or lion. A typical gun of this sort is the .348 Winchester 71, a lever-action rifle. There are also magnum rifles in .300, .330, and .375 calibers. A "magnum" is a rifle designed for an oversized cartridge with an oversized powder load, to give exceptionally high velocity. These guns can be had in lever, bolt, pump, and automatic actions; bolt action seems the most popular nowadays. Such guns are larger than those used for deer and black bear but smaller than real elephant guns. They have muzzle energies of 1,000 to 2,500 foot-pounds.

Others prefer a real elephant gun for thick-skinned large game. This is a double-barreled rifle, which looks rather like a shotgun.

Elephant guns come in .465, .475, .500, and .600 calibers, firing cartridges the size of bananas. With such a gun, one need not hit an elephant in a vital spot—as with one of the smaller rifles described above—to knock it off its feet. It works the other way, too. If the hunter is a small man or is not used to heavy guns, it may knock *him* off his feet. All these guns are made in Britain, and most cost over a thousand dollars.

A rhinoceros weighs about one ton, a hippopotamus two or three, an elephant two to ten. In the Mesozoic, one would hunt animals weighing as much as several elephants. Moreover, being reptiles, they would cling more stubbornly to life than a mammal. To make things harder, it would be almost impossible to shoot one in the brain, because they have practically none—just a little lump of tissue, the size of a golf or tennis ball, on the top of their spines.

Therefore the heaviest rifles would be none too powerful. That means the daddy of all sporting arms: the Continental .600, which weighs 14.5 pounds and packs 7,600 foot-pounds of muzzle energy. Several other makes come fairly close to this gun in power, such as Holland & Holland's .500 double express with 5,700 foot-pounds. But on a dinosaur, one might as well use a sling-shot as a gun with less than 4,000 foot-pounds of muzzle energy.

When we go back, the Cretaceous—the last of the Mesozoic periods—would seem rather exotic in flora, although many plants like magnolias, pines, sequoias, and willows would be familiar. There would be clumps of palmetto and giant fern, but little or no grass. Hence erosion would gouge the land into gullies, like the Western badlands. The Jurassic would seem like another world.

Of the dinosaurs, the sauropods and the armored dinosaurs (stegosaurs in the Jurassic, ankylosaurs in the Cretaceous) might as well be left alone. There would be no sport in shooting them, since they would simply stand around waiting to be attacked, relying on their size or on their spines and plates for protection. They would be almost unkillable, requiring a bazooka or an anti-tank cannon. And those small, blunt heads would be unimpressive trophies.

The duckbills and other large ornithopods would provide good trophies at little risk. They would be hard to approach, being wary.

The ceratopsians, or horned dinosaurs, from the late Cretaceous, would furnish the biggest heads. In fact, a seven-foot *Triceratops* head might weigh over a ton. Even if one could haul it back to base and get it into the time machine, one might find that, when one had mounted it in one's living room, there was no space left in the room for anything else.

Lastly there are the theropods—the bipedal carnivores. These range from lively little predators the size of a hen or a stork up to colossi like the carnosaurs *Allosaurus* and *Tyrannosaurus*, 40 to 50 feet long. These latter would be the most dangerous game of all time, requiring the heaviest gun, an iron nerve, and other hunters to back one up. The moment when one faces a big carnosaur is no time to panic, turn an ankle, catch a twig in the action of one's gun, forget to take the gun off safety, or climb a tree small enough for the animal to pluck one out of. There is not much use running away in the open. Although large carnosaurs' movements look slow and clumsy, they can cover ground faster than a man, because of the length of their ponderous strides.

People sometimes think that, because dinosaurs had small brains, they must have had dim senses. But this is not necessarily so. The ornithopods and the theropods, in particular, are believed to have had keen sight and smell and adequate hearing.

In dealing with carnosaurs, everybody lets the dinosaur have it and keeps on shooting until the creature is down for good. If brain shots are a waste of rounds, the dinosaurs have big hearts, weighing 50 or 100 pounds. A shot through the heart will at least slow one down. Several will kill it, although it sometimes takes it fatally long to realize that it is dead—fatally for the hunter, that is.

Little modern hunting is really dangerous; primitive man, facing big game with spears, needed much more nerve than a modern man with a high-powered rifle. Primitive men never hunted dinosaurs, since there were none in their time. But, if we could hunt dinosaurs with the best modern guns, we should be in a position like that of a tribesman facing a lion with a spear. That would be real sport, in which the game would have about as good a chance of getting the hunter as vice versa.

Best of all, one need not worry about depleting some rare species, because they are all extinct anyway!

